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EDITORIAL

ON SYDENHAM'S VIEW OF CAUSATION IN THE LIGHT OF SEVENTEENTH CENTURY THOUGHT.[1]

One of the older leaders of American medicine relates the following experience of his boyhood:

"But on this memorable afternoon, I stood on the hillside and looked over the Narragansett Bay, and wondered where all the catboats and schooners with their white sails came from, and were going to. Then my thoughts took this turn: 'The only person who can know that is God. He knows everything that has been, and is, and is to be. Then, hundreds and thousands of years ago, He knew that I should be here today, and that each of those boats would be just where it is, and that I should be thinking of them. Then, as His knowledge must have been perfect, it is absolutely necessary that I, just as I am, knowing just what I know, am here at this moment, looking at these ships, which also must be just where they are. Then everything must be arranged and ordered to be just as it is, and no one can prevent it. Therefore, I am not responsible for where I am nor for what I do'."

The stern Calvinistic training, which made this determinism virtually automatic in a particularly active-minded boy of eight, was not without its influence on these Scotch and English Puritan thinkers who played such an important rôle in the intellectual output of 17th century Britain; and this apart from the predetermination implicit in the philosophy of Spinoza, the predestination of Calvin or the "pre-established harmony" of Leibnitz. Thoughtful men of the Puritan century felt themselves, in Emerson's phrase, "in the presence of high causes"; but

[1]Read at a meeting of the Johns Hopkins Medical History Club on November 28, 1932

for the purposes of medical and scientific reasoning, causation has ever been a puzzle-headed affair. Consider, for instance, the Aristotelian tetrad of:

1. Material causes (the substance of the thing caused);
2. Formal causes (the basic idea in causation);
3. Efficient causes (the immediate or activating agent);
4. Final causes (the object of causation);

or the Galenic triad of:

1. Exciting (procatarctic) causes
2. Predisposing (pro-egumenic) causes
3. Immediate or proximate (synectic) causes,

common to the earlier text books of practice of medicine. Are not 2 and 4 in the Aristotelian scheme virtually identical, or at least related as plan and execution, where they do not entirely overlap? Do either the Aristotelian or Galenic schemes account for remote or primal causes? And what of immanent (self-contained or self-starting) causes (the *causa sui* of Spinoza) or transient causes (of collateral effect), or Newton's approximation of *verae causae?* Or the more scientific doctrine of multiple causation of Stuart Mill and Ernst Mach [f (x) = f (a,b,c,d. . . .n)]? In verity, a tangle, which has had much to do with the many futilities of medical theorizing in the past and upon which a ray of strong light was shed by a certain bold pronouncement of Thomas Sydenham's.

"Sydenham, the prince of practical physicians, whose character is as beautiful and as genuinely English as his name, did for his art what Locke did for the philosophy of mind—he made it, in the main, observational, he made knowledge a means, not an end."[2] So writes Dr. John Brown of Edinboro concerning Sydenham's contribution to bedside medicine, the field in which the doctor must exploit knowledge not always to be found in books. Among English speaking physicians, Sydenham is memorable

[2]So, too, Descartes affirmed that knowledge has no value except to strengthen and perfect the mental processes, that erudition is as nothing in comparison with discriminating intelligence, while for Spinoza, "mind" is synonymous with mental activity or the act of thinking.

mainly as a delineator of hitherto unknown diseases. As Sigerist expresses it: "Where Hippocrates wrote case-histories (many of them without labels or diagnosis tags), Sydenham wrote histories of diseases," which he described, named and established in the scheme of nosology, like so many species of plants. By the bedside, however, Sydenham, like Charcot, regarded this classical or base-line typology of disease as a mere mnemonic scheme, in aid of diagnosis. He never swerved from the great Hippocratic tradition: treat the patient as a whole rather than the disease, which he saw not as a fixed entity or thing, but as a constantly changing process within the body, an effort on the part of Nature to get rid of the *materies morbi* or pathogenic virus. In a period, great in respect of laboratory work but in which bedside practice had sunk to an almost primitive level, the achievement was not inconsiderable. Now the point of departure or jumping-off place of Sydenham's line of attack is his denial of ultimate causes, by which is meant, in the jargon of philosophy, not a denial of ultimate causation, of Aristotle's proposition that God is the first cause of Nature but a denial that the human intellect is capable of apprehending the complex ætiologic scheme of Aristotle's fancy except in a very feeble and ofttimes ludicrous way.

Centuries before Sydenham and centuries after him, the advancement of clinical medicine was to be hindered by the wild fancies of successive physicians as to the causation of disease, each pawing the air about the matter in a manner all his own, and still doing it in some quarters. Sydenham's declaration of independence has the direct, forceful approach of the old Parliamentary trooper that he was. It is contained in the preface to the third edition of his Medical Observations on the History and Cure of Acute Diseases (1676), and runs as follows:

"It is a ruination of our prospects to have departed from our oldest and best guide, Hippocrates, and to have forsaken the original *methodus medendi.* This was built upon a knowledge of immediate and conjunct causes, things of which the evidence is certain. Our modern doctrine is a contrivance of the word-catchers: the art of talking rather than the art of healing. That I

may not seem to speak rashly, I must be allowed a brief digression; and to prove that these remote and ultimate causes, in the location and exploitation of which the vain speculations of inquisitive busy-bodies are solely engaged, are altogether incomprehensible and inscrutable; so that the only causes which can be known to us and the only ones from which we may draw our indications for treating diseases are those which are immediate, proximate and conjunct."

Fourteen years after the publication of this bold brief for common sense, Locke, Sydenham's intimate friend, ventilates the same line of thought in his famous Essay on the Human Understanding (1690). The misfortunes of mankind, he says, are due to our tendency to go beyond the limits of human reason in attempting to explain our difficulties in adapting ourselves to environment. On July 27, 1656, when Locke, a youth of four and twenty, had only just taken his baccalaureate degree at Oxford, one Baruch, or Benedict Spinoza was excommunicated from the Jewish congregation at Amsterdam for merely hinting the same line of thought, which Sydenham ventilated with such perfect freedom twenty years later. The anathema pronounced upon Spinoza is informed with the same fanatical intensity as the ban put upon the leper in ancient Babylon 3500 years before: "May the Lord set him apart for destruction....Let no man speak to him, no man write to him, no man share the same roof with him, no man come nigh him." But where Servetus and Giordano Bruno had been burned at the stake, and Uriel Acosta driven to suicide for the crime of honest thought, Spinoza resumed, without affectation, the quiet habit of his life, supporting himself by the polishing of lenses, to become, in the end, the first of Nietzsche's "good Europeans." Spinoza's denial of final causes (that the scheme of nature is for the exclusive benefit of man) antedated Sydenham's view of the futility of prying into the remote causes (*causæ remotiores*) of disease by more than a decade and was expressed in full, in the manuscript of the Ethics, which was anonymously circulated during 1660-74, and published a year after Spinoza's death (1677)[3]. Six years before Syden-

[3]The problem of final causes was very much in the air in the 17th century.

ham's third edition of 1676, however, Spinoza had published a denial of final causes with reference to theological dogma in the first great brief for political and religious liberty, his *Tractatus theologico-politicus* (1670):

"God directs Nature according to the universal scheme of Nature, but not according to the particular dictates of human nature; and thus, God considers not merely human kind but Nature in its entirety."

In other words, the God of most men, as Thoreau observed, is simply Edward G. God or Thomas A. God, a magnified or expanded version of themselves, as if a triangle were to conceive of God as eminently triangular, or a circle to make the concept of godhead circular. To the feeble human intellect, the ultimate nature of God is inscrutable, nor does the infinite universe, in which man plays such an insignificant part, exist for the special benefit of man. Thus did Spinoza attempt to abolish a virtually polytheistic anthromorphism, or man's tendency to promote his precious self expanded to the nth power into godhead, as well as that other manifestation of human conceit, the anthropocentric view of the universe, which was not to be obliterated until Darwin's time. We are now in position to appreciate the more scientific statement of the denial of final causes which Spinoza gives at the end of the first book of his Ethics:

"There is no need to show at length that Nature has any special purpose in view, and that final causes are mere figments of the human mind (*Omnes causas finales nihil humana esse figmenta*). That which is really a cause is conceived as an effect and *vice versa* . . . If a stone falls from a roof on someone's head and kills him, they will demonstrate by their new method that the stone fell to kill the man . . . So they pursue their inquiries from cause to cause, until, at last, they take refuge in the will of God, that sanctuary of ignorance . . . The eternal and infinite being which we call God or Nature acts by the same necessity as that whereby it exists. Therefore as God does not exist for the sake of an end, so neither does God act for the sake of an end. Of his existence and of his actions, there is neither

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A denial of final causes was adumbrated by Bacon, Descartes and Gassendi, but the most conclusive and definite statement was that of Spinoza. Robert Boyle defended the teleological (Galenic) view in his "Disquisition about the Final Causes of Natural Things," London, 1688 (Item 186 of J. F. Fulton's Bibliography of the Honorable Robert Boyle, Oxford, 1932, 115).

beginning nor end. Wherefore, a cause which is called final is naught but a human whim."

In other words, Spinoza, with splendid stoicism, denies both the formal and the final causes of the old Aristotelian schema. A denial of final causes is, indeed, implicit in the first agonizing cry of prehistoric man overtaken by a fatal disaster, and has existed as a *schwebender Gedanke* from the beginnings of recorded time. The mother beside her dying child, the human being in the clutch of violent death or some other coil of fate, cries vainly "why?" but reason, as Lotze said, tells that it is only given us to inquire "how?"; or as Sir William Gall expressed it: "Savages explain: science investigates." With reference to either ultimate or final causes, man is still

> "An infant crying in the night,
> And with no language but a cry."

Galen's mistake, as Sudhoff points out, was that he was always cocksure in telling us "why", instead of humbly inquiring "how."[4] Spinoza explains our ignorance, or rather our ineptitude about final causes by his doctrine of "inadequate ideas." In other words, our failure to assign efficient causes, to solve difficult problems or to handle difficult situations with ability, springs from the fact that our fundamental ideas about things themselves are hazy, confused, and in spite of ourselves, originate, not from clear cold cerebration, but from feelings or emotional states. Adequate ideas, by parity of reasoning, would originate in a mind complete and omniscient in itself, functioning impersonally, with no special viewpoint or pre-

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[4]"Why" is a speculative, but not a scientific query. The relation of the psychological and metaphysical aspects of final causes to the apparently purposeful healing processes of the body (*vis medicatrix naturae*) and the physician as coadjutor (*medicus minister naturae*) has been exhaustively discussed by Dr. William H. Welch in his address on "Adaptation in Pathological Processes" (*Tr. Ass. Am. Phys. and Surg.*, New Haven, 1897, IV, 284-310). Dr. Welch has kindly called my attention to the error of confusing final causes (teleology) with remote or ultimate causation; but in the 17th century, the two concepts were confused, as witness the many sermons imputing epidemics to the wrath of God.

judice, like a sensitized photographic plate. It will be seen at once that no human being to date has had adequate ideas of things, except in a very relative sense. Hence, as all great philosophers have maintained, our notions of the fundamental nature of any phenomenon are necessarily fragmentary and incomplete. Behind the accessible *phenomenon* stands the inaccessible *noumenon.*

Let us consider a few instances of the effect of inadequate ideas functioning as final or even efficient causes upon medical reasoning in the past. First of all, the doctrine of supernatural causation of diseases, as punishments inflicted by angered gods or angered spirits of the dead, is common to all savages, primitive and semi-primitive peoples and with it necessarily goes the scheme of treatment by spells and incantations against these malign influences, set off by psychotherapy and crude folk medicine. Here we have the limiting case of both ultimate and final causation with a vengeance, and when the patient did recover, it was due to natural healing processes inside his own body, as Hippocrates and Sydenham maintained, but hardly to the shaman or medicine-man. Again, the humoral pathology of Hippocrates was the weak link in the chain of Sydenham's own reasoning about medicine—the one point in his armor which was vulnerable to the fallacy of final causes. The revival of this humoral view of the mechanism of disease by the serologists turned Virchow into a disagreeable bigot and reactionary, since it threatened to abolish his cellular or solidist pathology. A few years later, Besredka signalized a solidist immunity in the tissue cells, coexisting with the humoral immunity, allocated to the blood, and back of both, there may be something else. In like manner, Galen's unfailing facility in improvising explanations for almost any happening, his monotonous Bridgewater teleology, his tendency to take all knowledge for his province, was responsible for most of the false reasoning about medical problems during the 1700 years preceding the death of Bichat. As Professor Neuburger has shown, the entire fabric of experimental neurophysiology in the 17th and 18th centuries had to be

scrapped on account of faulty directives and glaring ignorance of the gross anatomy of the laboratory animals employed. In the 18th century, each of the outstanding physicians of the period had a pet theory and a secret remedy all his own, upon which he stood as upon a pedestal. In consequence, quacks of the same type, standing upon the pedestal of a secret remedy, literally swarmed in this period. The doctrine of laudable pus, or healing by second intention, hampered successful wound treatment and surgery from the time of Galen to the advent of Lister. The rest cure of Weir Mitchell had a tremendous vogue among the neurotics and neurasthenics of his generation, but like Muldoon's rough handling of broken-down sports, it is no longer fashionable. The 16th century controversy about derivative and revulsive blood-letting was mainly a teapot tempest, turning upon ignorance of the fact that the blood circulates in the body. Kämpf's theory of infarcation started the 18th century vogue of clysters, which, like the multifarious ovariotomies and hysterectomies of our student days, is now no more. The endless controversies about mechanistic and vitalistic aspects of physiologic processes have little or nothing to do with the art of getting sick people well.

The general run of mankind, as Cardinal Newman observed, are more easily influenced by types and prevailing fashions than by ideas, arguments and pure reason; but what of the intellectual supermen who imposed these types and fashions upon them, in the first instance? Even Spinoza, the most outstanding example of a grown-up mind in the history of philosophy, abounds in inadequate ideas, particularly in his initial definitions, postulates, and fundamental propositions, which, as his published correspondence reveals, were not always intelligible to his intimates and, indeed, illustrate the fact that 17th century prose was still too involved, too cryptic, to be a reliable medium for the clear expression of scientific thought. Better still, Spinoza frankly admits the inadequacy of his own ideas in certain directions:

"If I am asked to consider whether a man who wilfully dies of starvation or thirst because he cannot choose between food or drink, is to be regarded as an ass rather than as a man, I answer that I do not know. Neither do I know how to judge a man who hangs himself or how we should regard children, idiots, madmen, and so on."

In his Ethics, Spinoza attempted to get around his difficulties with inadequate ideas by employing geometric demonstration, which, he says, furnishes "another criterion of truth by considering solely the essence and properties of figures without reference to their final causes." In spite of Huxley's assertion that mathematics yields no more than we put into it, it is now pretty well known that mathematical equations can do work for the mind which the mind alone would be incapable of performing; first by extrapolation, such as computing the population of the United States in 1950 from our present figures; or even by simple inspection, as when Hertz discovered the electric waves of wireless telegraphy and radio by pondering Maxwell's six equations expressing the electromagnetic theory of light. "These equations," said Hertz, "are wiser than we are." By such methods, astronomers and mathematical physicists, from Galileo and Newton to Einstein, have been able to predicate all we know about the mechanisms of the solar system and the expanding universe and Willard Gibbs expressed the fundamental theorems of physical chemistry in mathematical language at least 10-20 years before their experimental verification in the laboratory by Dutch chemists. By these methods, Spinoza arrived at results, startling in his day, which have been confirmed by the findings of recent physiology. One of the best of that very dubious category, the American novel, is based upon the following sentences from his Ethics:

"Decisions of the mind arise in the mind by the same determinism as our ideas of existing things. Therefore those who believe that they speak or keep silence or perform any act by a decision of the mind do but dream with their eyes open."

In the language of recent physiology: All fundamental actions are instinctive and have nothing whatever to do with states of consciousness. The natural man, or "good animal" of military parlance, is a brain-stem animal,

"With all his instincts fresh,
Not buzzing helpless in reflection's mesh."

Even the psychic mechanisms in the neuropsychoses are, in Charcot's view, predetermined, and as the great mathematician Jacobi affirmed, *"Nur in der Bewegung des Gedankens ist der Mensch frei."* In other words, our minds do move and we bask in the illusion that the movement is free and not predetermined. By similar reasoning, *more geometrico,* Spinoza arrives at his famous definition of love, which he states with mathematical solemnity and without any apparent ironic intention: "Love is a pleasurable inner excitement accompanied by the notion that the cause of it is external." In the 17th century, Spinoza's period, well-bred young ladies in England sang to the harp the following ditty of Henry Purcell from Dryden's Indian Queen:

"I attempt from Love's sickness to fly
Since I am myself my own fever and pain;
No more now, fond heart, with pride no more swell,
Thou cans't not raise forces enough to rebel,
For love has more power and less mercy than fate
To make us seek ruin and love those that hate."

In another place, the same poet laureate (Dryden) affirms:

"The cause of love can never be assigned:
'Tis in no face but in the lover's mind."

In brief, another *schwebender Gedanke* of the 17th century.

The analysis of human passion and emotions, which made Spinoza's Ethics so epoch-making, owed something, no doubt, to Descartes' treatise *Sur les passions de l'âme* (1650); but through it all runs a certain remorseless thread of scientific reasoning which is Spinoza's very own and which led Johannes Müller to incorporate a German version of the third book of the Ethics in his treatise on physiology, because "it is impossible to give any better account of the matter than Spinoza has expounded with unsurpassed ability." The propositions of the second and third books are nearly all of them psycho-physiological. The very *raison d'être* for our present development of anatomy, physiology and practice of medicine is implicit in Spi-

noza's statement that the thinking brain has no adequate knowledge of the parts of the human body nor of its workings, save through information conveyed by changes affecting the body ("The healthy know not of their health but only the sick"). As we have seen, Spinoza denies Descartes' proposition that the mind is autonomic, controlling its own movements, but he does affirm that the body has an autonomic power to do things independently of the act of thinking. In other words, we think we think, but the tracts controlled by the sympathetic-autonomic system operate on their own ("the body thinks"). If the body is sluggish or inert, the mind is dull and *vice versa;* and whatever hinders bodily activity hinders mental activity, or the other way around. Mental decisions or suspensions of judgment are illusory, and when apparently spontaneous, are predetermined by a perception or memory of having considered or done things before. So, too, Ewald Hering attributed the functioning of protoplasm itself to "facultative memory," an automatic power of doing what it had once learned to do in the primeval past. We cannot even utter a single word except through recollection of having done so before. We cannot remember or forget at will. The mind is free only in respect of what it remembers. Feeling is anterior to thought, which organizes itself through the development of speech and language. Actions, thoughts and dictates of the mind are really shaped by emotions, except where conflicting emotions nullify each other, like the conflicting waves of sound of Doppler's principle in acoustics. The mind is therefore enslaved or passive in so far as it is activated by confused or inadequate ideation springing from emotion. Passion is the utter domination of mind and body by a single emotion. We are only free in regard to moderate, insignificant desires or memory of things done. The mind in equilibrium (free from emotional stress) is easily swayed this way or that, but contrary emotions, says Spinoza, make people see the better part and follow the worse, whence our strong active dislike of nagging, bulldozing (*imponiren*), bully-ragging, activators, fanatics who "make a noise like a reformer"

and suchlike.[5] The mind in Spinoza's view, actually experiences pain in the contemplation of its own weakness, since mind and will-power, as he sees it, are indistinguishable. Thus does Spinoza pyramid up to his great terminal chapters "Of Human Bondage" and "Of Human Freedom." Here "good" and "bad" are mere relative terms, while justice and injustice, sin and merit are extrinsic, "all-too-human" ideas, not related to the fundamental attributes of the mind; humility, repentance and reverence mere modes of mental enslavement, and consternation "a species of cowardice." He who does good out of timidity is not led by reason but a slave ("His heart sins though he fears"). Sin is inconceivable in a state of nature and is defined by Spinoza as disobedience to the State, punishable by the State. Joy is a passage from a lesser to a greater perfection, sorrow the reverse; hence evil is whatever hinders a human being from maintaining his individuality or developing it to a higher level. Thus, Spinoza's criteria of sin and evil are not those entertained by modern scientific men. Yet he maintains that what differentiates the matricide of Orestes from the matricide of Nero was the fundamental evil in Nero's nature. In and for itself, the goodness or badness of the deed is relative, as the fangs of the cobra are good for the cobra but bad for other animals, or as murder, rape, theft and adultery have been religious observances in certain times and places, but elsewhere punishable crimes. Freedom of the mind from the bondage of inadequate ideas is attained by the *beatitudo in intellectu,* in other words by reducing desire and emotion to a minimum—

"Give me the man who is not passion's slave,"

and where this beatitude is attained, philosophy becomes, in very deed, "divine philosophy," a mode of "seeing God."[6]

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[5]"He, who, guided by emotion alone, tries to make others like what he likes, or to make the rest of the world live according to his particular notions, acts solely from impulse, and is therefore hateful." *Ethics* IV, 37, Note 1.

[6]In his memorial address on the quay of the Paviloengragt (The Hague) on February 21, 1877, Renan affirmed that "here God was seen closely for the first time."

But although Spinoza's ethical system, his notion of human freedom, is based upon morality kindled by the dominance of emotions of a higher order ("his footstep in the *vera vita,* his eye on the beatific vision"), it would be a mistake to regard it as a religious system. It is rather a *Weltanschauung,* and from this angle, the members of his congregation knew just what they were about when they excommunicated him and he himself was serenely aware of the fact. To Spinoza, the expanding universe, as we conceive it, is but one of an infinite number of manifestations of God, "a conception which," in the words of Froude, "makes us giddy in the effort to realize it." Slowly but surely, his reasoning permeated and pervaded modern thought, to become, for a long time, the religion of scientific men. It exerted a profound influence upon the writings of Lessing, Goethe, Coleridge,[7] Wordsworth, Shelley (who began a translation of the Ethics), George Eliot (who completed one), Matthew Arnold (*The Sick King in Bokhara*), Froude and Emerson.

Thus Goethe:

"Nature goes her own way and all that to us seems an exception, is really according to order."

"Nature has no feeling; the sun gives his light to good and bad alike and moon and stars shine out for the best and worst of men."

"Nature is always right and most profoundly so where we least comprehend her."

"Nature is the living, visible garment of God."

"Nature works by such eternal necessary laws that God himself could alter nothing in them." ("Nature must obey necessity." *Julius Caesar,* IV, 3.)

Or Emerson's reading of *amor Dei intellectualis in* "The Bohemian Hymn" ("In nothingness I put my trust.")

"In many forms we try
To utter God's infinity,
But the boundless hath no form,

[7]Coleridge evolved for Christianity and Spinozism the equations W-G=O and G-W=O; but his algebra was poor, since transposal of the negative quantities would give, in both cases, W=G or the identification of God and the world. To Spinoza, however, the perceptible universe was created Nature (*natura naturata*), behind which stands creative power (*natura naturans*).

> And the Universal Friend
> Doth as far transcend
> An angel as a worm.[8]
> The great idea baffles wit,
> Language falters under it,
> It leaves the learned in the lurch;
> Nor art nor power nor toil can find
> The measure of the eternal mind
> Nor hymn nor prayer nor church."

The mind of Spinoza was a mind of mathematical type, which assimilated the geometric method of Descartes, and, like other mathematical minds, read order and system into the universe[9]; whereas the mind of biologic type, of the Darwin—Mendel—Nietzsche phase, sees, if not chaos, a chaotic scheme of spontaneous creation of species, which war upon one another, among which, in fact, the struggle for existence is at its fiercest between individuals of the same species. As compared with most, Spinoza himself was one of those

> "Milder natures, and more free,
> Whom an unblamed serenity
> Hath freed from passions, and the state
> Of struggle these necessitate;
> Whom schooling of the stubborn mind
> Hath made, or birth hath found resign'd;"

which is only another way of saying that his nature fulfilled Renan's criterion of the spiritual aristocrat, "to be born essentially impersonal." His freedom from the thraldom of emotional bondage was implicit in his Vergilian calm; his attitude toward the errors of mankind was "*tout comprendre c'est tout pardonner*" (*non ridere non lugere, neque destestari, sed intelligere*). Yet, on occasion toward the end of his life, Spinoza could envisage human society

[8] In his letter to Oldenburg (Epistle XV), Spinoza likens man's status in the infinite universe to a small worm in the blood, which knows vaguely the investing medium but nothing of the body or the external world beyond.

[9] Let this statement be checked by Julian Huxley's pungent commentary on the line from Young's Night Thoughts: "An undevout astronomer is mad." (*The Captive Shrew*, Oxford, 1932, 45-48.)

(man at peace) with the unsparing realism of a journalist of approved modern type:

"For this is certain, and we have proved its truth in our Ethics, that men are of necessity liable to passions, and so constituted as to pity those who are ill, and envy those who are well off; and to be prone to vengeance more than to mercy: and moreover, that every individual wishes to make the rest to live after his own ideas, and to approve what he approves, and reject what he rejects. And so it comes to pass, that, as all are equally eager to be first, they fall to strife, and do their utmost mutually to oppress one another; and he who comes out conqueror is more proud of the harm he has done to the other, than of the good he has done to himself. And although all are persuaded, that religion, on the contrary, teaches every man to love his neighbour as himself, that is to defend another's right just as much as his own, yet we showed that this persuasion has too little power over the passions. It avails, indeed, in the hour of death, when disease has subdued the very passions, and man lies inert; or in temples, where men hold no traffic, but least of all, where it is most needed, in the law-court or the palace. We showed too, that reason can, indeed, do much to restrain and moderate the passions, but we saw at the same time, that the road, which reason herself points out, is very steep; so that such as persuade themselves that the multitude of men, distracted by politics, can ever be induced to live according to the bare dictates of reason, must be dreaming of the poetic Golden Age, or of a stage play."[10]

"For men in time of peace lay aside fear and gradually from being fierce savages become civilized or humane, and from being humane become soft and sluggish, and seek to excel one another not in virtue, but in ostentation and luxury. And hence they begin to put off their native manner and to put on foreign ones, that is, to become slaves.

"To avoid these evils, many have tried to establish sumptuary laws; but in vain. For all laws which can be broken without any injury to another, are counted but a laughing-stock, and are so far from bridling the desires and lusts of men, that, on the contrary, they stimulate them. For 'we are ever eager for forbidden fruit and desire what is denied'."[11]

While Spinoza's reasoning about final and ultimate causes is bound up with his enlarged conception of God, of an infinite universe expanded to infinite dimensions ($\infty \times \infty$ that of Sydenham about the causation of disease concerns the world of the infinitely little, which was opened up by microscopy and tends towards such concepts as ultrascopic viruses, syzygy, the contents of the Bohr atom, Abderhal-

[10] *Tractatus politicus*, 1, 5.
[11] *Ibid.*, X, 4-5.

den's trillions of amino-acid reactions in a moment of intracellular metabolism or the Heisenberg "principle of indeterminism," in virtue of which at least half of the initial conditions of a physical phenomenon are non-existent beforehand and come into being spontaneously, at the determination of the event in question. Let us hope, indeed, that biophysics may ultimately throw light on such sparingly soluble problems as cancer, insanity or the respiratory affections. If so, the doctor will use the new knowledge as he does antitoxin, insulin or radiotherapy; but in general, his bedside reasoning, called intuitive but based upon multiplex memories, must and will continue along the plain, practical lines indicated by Sydenham. At the bedside, the physician must think, not biophysically, nor even biologically, but must remain a doctor of medicine, thinking medically, in keeping with the aphorism which Goethe wrote in his album: "Common sense is the genius of humanity" (*Le sens commun, c'est le génie de l'humanité*).

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